

For: IGARSS'97 "Innovations in Geoscience and Remote Sensing Education" Session

## Practical Uses of Math And Science (PUMAS)

Web Site: <http://pumas.jpl.nasa.gov>

**Ralph Kahn, Jet Propulsion Laboratory/California Institute of Technology, 4800 Oak Grove Drive, Pasadena, CA 91109. Tel.: 818-354-9024; FAX: 818-393-4619; e-mail: [ralph.kahn@jpl.nasa.gov](mailto:ralph.kahn@jpl.nasa.gov)**

### Oral Paper

Practical Uses of Math And Science [PUMAS (**poo'.mas**)] -- the On-line Journal of Math and Science Examples for **Pre-College** Education -- is a collection of one-page examples of how math and science topics taught in K-12 classes can be used in interesting settings, including everyday life. The examples are written primarily by scientists and engineers, and are available to teachers, students, and other interested parties via the PUMAS Web Site. Our goal is to capture, for the benefit of **pre-college** science education, the flavor of the vast experience that scientists have with interesting and practical uses of math and science...

All examples are peer-reviewed by at least one scientist, with a relevant background, and at least one teacher, at an appropriate grade level. Once accepted, the example is a citable reference, in a refereed journal of science education. PUMAS examples may be activities, anecdotes, descriptions of "neat ideas," formal exercises, puzzles, or demonstrations. They may be written in any style that serves the material well.

Teachers already have textbooks. But the exercises in them are often routine and uninteresting, written by people with only limited experience at actually using the ideas presented. The intention of PUMAS is to give teachers a resource to supplement the **textbook. So a teacher who has taught "cosines" for thirty years, but never actually used a cosine for anything except to teach it, can benefit from the ways scientists describe how they use cosines.**

Teachers can search the PUMAS collection based on curriculum topic, grade level, subject keywords (such as airplanes or dinosaurs), or any other parameters in the example headers. They then scan through the relevant examples, and develop ideas of their own about how to use the material to enrich their presentations. This relieves scientists of the obligation to develop "curricula," which few of us are equipped to do. It puts the job of "integration into the lesson plan" on the teacher, who is in the best position to judge the students' needs, abilities, and interests, as well as the teacher's own interests and proclivities.

There are several mechanisms for obtaining feedback from users. A "Comments" file is attached to each example; teachers can submit comments on particular examples, such as experiences with the example in the classroom. Subsequent users can view all previously posted comments. There is also an "Examples Wanted" Bulletin board, where requests for new examples can be posted, and a formal "On-line Teachers' Assessment Form."

We began designing the PUMAS Web Site in the spring of 1996. **We are currently in need of examples**, and anticipate opening the Site to general users in late 1 **997**, once the collection contains a number of entries. The "Contributors' Page" on the PUMAS Web Site describes how to use the automatic submission process. K-12 teachers and scientists are also needed now, to serve in the pool of PUMAS reviewers. The on-line "Participant Volunteer/Update Form" can be found from the Navigation portion of the Help page, or from the **hyperlink** at the top of the PUMAS Examples Search page.